

CME Review

Special challenges in treatment and self-management of older women with asthma



Alan P. Baptist, MD, MPH ^{*,†}; Ahmad Hamad, MD [‡]; and Minal R. Patel, PhD, MPH [†]

^{*} Division of Allergy and Clinical Immunology, Department of Internal Medicine, University of Michigan, Ann Arbor, Michigan

[†] Center for Managing Chronic Disease, Department of Health Behavior and Health Education, University of Michigan School of Public Health, Ann Arbor, Michigan

[‡] Department of Internal Medicine, Wayne State University, Detroit, Michigan

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Learning Objectives:

At the conclusion of this activity, participants should be able to:

- Discuss the factors contributing to increased morbidity and mortality among older women with asthma
- Describe mechanisms by physicians to improve the care of older women with asthma

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Introduction

Asthma is one of the most common chronic conditions in the United States, and prevalence is currently at historically high levels. The most recent figures from the Centers for Disease Control and Prevention reveal that approximately 13% of adults have ever been told they have asthma, and 8% still have asthma.¹ Asthma is marked by significant health disparities, with certain population subgroups exhibiting increased prevalence and worse health outcomes. One such group is older asthmatic women, in whom the highest asthma mortality rate is seen.

Although the prevalence of asthma in elderly populations is no different than the general population, the morbidity and mortality figures are strikingly worse. For example, the death rate among those older than 65 years is by far the highest, nearly 4 times higher than the overall mean rate.² Moreover, physician office visits per 100 persons with asthma are highest in those older than 65 years.³ Although the rate of emergency department visits is no higher than other age groups, hospitalizations are again disproportionately higher among older adults (Fig 1). This finding suggests that older adults with asthma who visit the emergency department are more likely to require hospitalization and to have a fatal asthma event than individuals from other age groups.

Sex discrepancies in asthma prevalence and outcomes are evident. Among all adults, women are significantly more likely to report asthma than men (9.9% vs 6.2%). In those older than 65 years, 9.1% of older women and 5.7% of older men noted current asthma in 2011.⁴ Among elderly populations, women have the most asthma. From 2007 to 2009, the asthma mortality rate was by far the

highest in women older than 65 years, and this rate was 30% higher than in men older than 65 years.² The asthma death rate among older women is approximately 4 times higher than the overall total. Women older than 65 years are also nearly twice as likely as men older than 65 years to visit the emergency department for asthma. When considering asthma hospitalization rates by age and sex, older women had the highest rate of any subgroup.³ Therefore, understanding and improving asthma outcomes for older women are desperately needed to decrease health care costs, improve outcomes, and reduce health disparities.

Until recently, little research has focused on the unique asthma challenges of women or elderly people. The purposes of this review are to examine factors that may contribute to the unequal burden of asthma among older women and to present practical solutions to improve care in this population.

Menopause and Hormone Replacement Therapy

Several studies have documented the effects of hormones, such as estrogen and progesterone, on airway caliber and asthma exacerbations. During the perimenopausal period, significant fluctuations in estrogen levels are observed; after menopause, the gap between estrogen and progesterone levels is pronounced because of a higher estrogen-progesterone ratio, although levels of both hormones decrease.⁵ Although the relative risk of new-onset asthma is not affected by menopause, this is not true for menopausal women receiving hormone replacement therapy (HRT). A recent meta-analysis found that postmenopausal women receiving HRT had an increased risk of asthma compared with premenopausal women.⁶ Other work has found that the use of postmenopausal HRT was associated with a 2.24-fold increase in newly diagnosed asthma but not chronic obstructive pulmonary disease (COPD).⁷

Conversely, in women with preexisting asthma, HRT is often associated with improvement in respiratory symptoms and

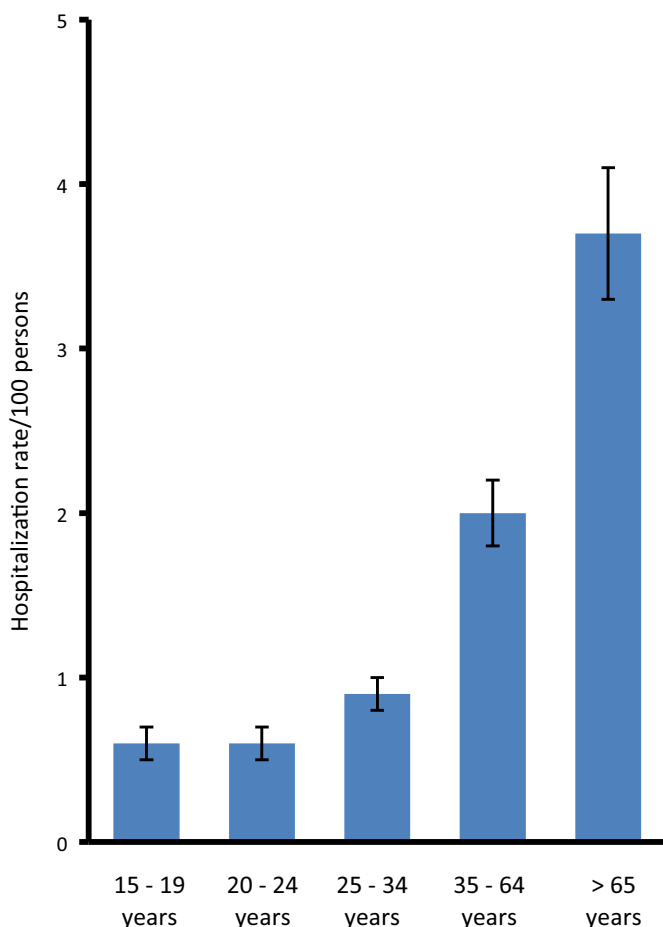


Figure 1. Mean (SE) annual asthma hospitalization rates by detailed age group, United States, 2007–2009. Data are from Moorman et al.³

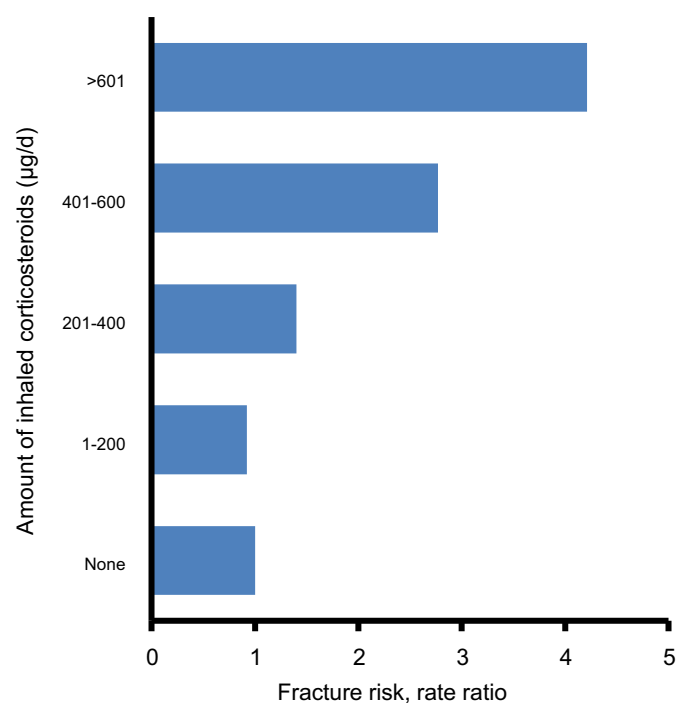


Figure 2. Association between inhaled corticosteroids and fracture incidence in model adjusted for sex, age, oral corticosteroid use, short-acting β -agonist use, nebulizer use, use of theophyllines, and a diagnosis of asthma and/or chronic obstructive pulmonary disease. Data are from Hubbard et al.¹⁴

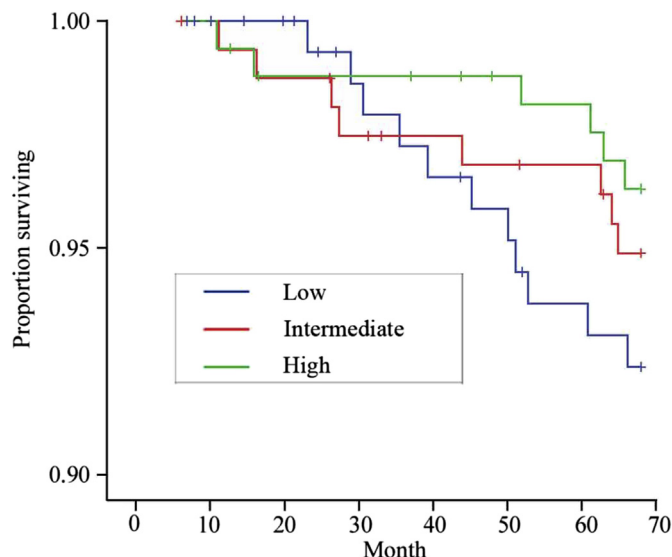


Figure 3. Kaplan-Meier curves for survival of patients according to the perception of dyspnea. Reprinted with permission from Ibihara et al.²⁴

decreased asthma exacerbations.⁸ Menopause tends to increase the number of asthma exacerbations.^{5,9} In fact, the peak age for asthma exacerbations in women occurs at 50 years,¹⁰ which is also the mean age of menopause in the United States. This may indicate that sex hormones have a protective effect in asthma or that fluctuations in estrogen levels can be particularly detrimental. A large study of 1,200 asthmatic women found that significant respiratory symptoms were nearly twice as common during the perimenopausal period, and forced expiratory volume in 1 second decreased by approximately 150 mL.¹¹ Asthma in women that begins after menopause can be problematic. This phenotype of asthma is frequently severe and nonatopic and often requires oral corticosteroids for control.¹² The risks and benefits of HRT must be considered, and the asthma specialist is in a unique position to offer specific information to assist in making decisions about HRT.

Adverse Effects of Medications

Elderly women may be particularly at risk for adverse effects of inhaled corticosteroids (ICSs). Postmenopausal women (but not premenopausal women) treated with an ICS had significantly lower bone mineral density than age-matched controls.¹³ A large study of more than 1600 elderly individuals with either asthma or COPD (mean age, 81 years) who denied any previous use of oral corticosteroids found a dose-dependent positive association for fracture risk with the use of ICSs, with those taking high-dose ICSs having a 4.5-fold increased risk compared with those never exposed (Fig 2).¹⁴ Because postmenopausal women constitute most of those with osteoporosis, special attention must be given to the screening, prevention, and treatment of this disorder for those taking an ICS. Other systemic effects of ICSs, such as glaucoma, cataracts, and adrenal suppression, are also more common in elderly populations^{15,16} and should be evaluated in older asthmatic women. Given the tremendous morbidity associated with adverse effects from an ICS, all older women with asthma who require ICSs should undergo periodic bone mineral density screenings and ophthalmologic examinations. Currently, ICS use is the cornerstone of chronic asthma management, and therefore the benefits may outweigh the risks.

Treatment of comorbidities can also be problematic for older adults with asthma. β -Blockers, aspirin, and nonsteroidal

anti-inflammatory drugs may all be used for a variety of conditions, and each may also worsen asthma. Dysrhythmias are far more common in elderly people taking β -agonists, especially in those who have previously had a myocardial infarction.¹⁷ Elderly people are more likely to have tremor and nausea associated with β -agonist use.¹⁸ Therefore, a comprehensive history and careful investigation for medication adverse effects are critical when caring for older women with asthma.

Perception of Breathlessness

An important mechanism to prevent the progression of an asthma exacerbation is early intervention and treatment.¹⁹ Unfortunately, elderly people have a decreased perception of airflow obstruction.^{20,21} Altered perception of airflow limitation has also been found in women compared with men, although the mechanisms that explain these differences are unclear and may be multifactorial.^{22,23} A recent study of elderly individuals (64% female) found that those with a decreased perception of airflow obstruction had greater medication costs, hospitalizations, and mortality compared with elderly individuals with a better perception of dyspnea (Fig 3).²⁴

One tool that may help to overcome the decreased perception of breathlessness in older women is self-monitoring with a peak flow meter. The current National Institutes of Health asthma guidelines recommend self-monitoring as an important component of asthma self-management and consider this an evidence level A recommendation.¹⁹ The guidelines state that a peak flow meter should strongly be considered for certain subgroups of asthma patients, including those who have a poor perception of airflow obstruction. Therefore, we advocate for the use of a peak flow meter for older women with asthma.

Comorbidities

Among adults with asthma, more than half report one or more coexisting health conditions, with higher rates among women.²⁵ As people age, it is not surprising that the number of medical conditions and medications to manage these conditions increases. In the United States, a staggering 40% of those older than 65 years use 5 or more prescription medications on a daily basis.²⁶ Patients with multiple chronic medical problems have several challenges to ensure optimal management of each of their conditions. There can be interactions among conditions, difficulties in determining which medical problem is primarily active when the symptoms are similar, decreased adherence with multiple medications, and conflicting recommendations in self-care management.²⁷ One study of older adults with asthma (in which women comprised 85% of the cohort) found that some patients with coexisting cardiac disease and asthma had been instructed by their physician to try medications for both conditions simultaneously and/or sequentially during episodes of dyspnea.²⁸ Medication and self-management costs can increase exponentially in elderly patients with multiple comorbidities, and therefore certain conditions may receive suboptimal care because of a lower prioritization by the individual.²⁹

Recent data indicate that women with multiple comorbidities often think that asthma is not their primary health problem. In a qualitative study of 25 African American asthmatic women (mean age, 52 years) with a mean of 5.7 chronic conditions in addition to asthma, fewer than half named asthma as a top priority, either alone or in combination with another condition, such as heart disease, diabetes mellitus, or arthritis.³⁰ These women admitted that asthma takes a “backseat” to other conditions, especially during asymptomatic periods; however, they also noted that asthma interferes with recommended physical activity for management of comorbidities.

Table 1
Strategies to Improve the Care of Older Women With Asthma

1. Menopause is often associated with worsening asthma. Hormone replacement therapy can help; however, the risks and benefits should be considered.
2. Elderly women are at increased risk of fracture and ocular effects from an inhaled corticosteroid. Periodic bone mineral density screenings and ophthalmologic examinations are appropriate.
3. A peak flow meter can help to overcome decreased perception of breathlessness.
4. Discuss comorbidities and emphasize that control of asthma will allow the older asthmatic woman to better manage other medical conditions.
5. Screen for depression and treat or refer as appropriate, given the high prevalence of depression among older women and its strong association with asthma.
6. For obese or overweight older women with asthma, work with the patient and primary care physician to encourage weight loss.
7. Assess caregiving roles that your patient may have. Connect her with appropriate resources.
8. Limited income or poverty is common among older women. Determine the financial abilities of your patient to adhere to recommended therapies.
9. Incorrect inhaler use is common among elderly patients. An asthma educator can teach more than 90% of older adults how to properly use an inhaler.
10. There is decreased responsiveness to short-acting β -agonists among the elderly population. Consider manipulation of the anticholinergic and/or leukotriene pathways.

To improve care of the older asthmatic woman, physicians should consider discussing the importance of chronic disease management with multiple comorbidities. For example, highlighting that suboptimal asthma control can make exercise and weight loss problematic can impress on the patient the importance of regular asthma care. Control of asthma may make it possible for the older woman to reduce the burden of other conditions, including cardiac disease, diabetes, and arthritis.

Depression

A comorbidity that deserves special attention for older women is depression. Multiple studies have found that asthma is associated with depression and that more severe asthma is associated with a greater risk and severity of depression.^{31,32} This association is especially pronounced in elderly women. A study of 317 older asthma patients from the inner city (83% female) found that depressive symptoms were associated with worse asthma control and lower quality of life, along with lower rates of adherence to controller medications.³³ Similarly, a study of 77 older adult patients (77% female) found that when comparing multiple demographic, psychological, and physiologic characteristics (including asthma severity, previous asthma exacerbations, forced expiratory volume in 1 second, exhaled nitric oxide levels, and medical comorbidities), depression was most strongly associated with lower asthma quality of life and control.³⁴

Persistent asthma is a disease that requires daily medications (often inhaled corticosteroids) even if an individual does not have symptoms. Unfortunately, adherence and outcomes can be significantly worse in those with asthma who also have depression, anxiety, or other mental health disorders. Depression and depressive syndromes have an extremely high prevalence among the elderly female population, with rates ranging from 15% to 35%.^{35,36} Studies consistently find that the rate is higher among older women than older men.^{35,37} Treatment of depression among asthma patients of varying ages has improved asthma outcomes.^{38,39} To optimize care, physicians of older women with asthma should consider screening patients for depression (for example, with the Geriatric Depression Scale)⁴⁰ and treat or refer as appropriate.

Obesity

Obesity is increasing globally and has taken on epidemic proportions in the United States. Elderly populations have the highest prevalence of obesity of any age group, and once again it is women who are most affected. The current overall prevalence of obesity among US adults is 35.7%, yet for women older than 60 years, it is 42.3%.⁴¹ There are also racial/ethnic disparities in the obesity rate among women aged 65 to 74 years, with 54% of non-Hispanic black women compared with 39% of non-Hispanic white women being classified as obese.⁴²

An increased prevalence of asthma has been reported among obese individuals, and this association is evident among all racial/ethnic groups.^{43,44} Although the mechanisms through which obesity influences the development and severity of asthma are beyond the scope of this review, they are thought to involve mechanical, inflammatory, and common etiologic factors.⁴⁵ Obesity has more consistently been associated with asthma in women than men.^{44,46} This finding may suggest an interactive effect between estrogen or progesterone and obesity. In obese women with asthma, even modest weight loss is associated with a significant improvement of asthma outcomes.^{47,48} The asthma specialist should therefore work in partnership with the patient and primary care physician to encourage weight loss for overweight or obese older women.

Primary Caregivers

As adults age, women are often enlisted to serve as the primary caregiver for a spouse, friend, or family member with a chronic, serious illness, such as heart disease, mental illness, cancer, and COPD.^{49–51} Such studies consistently highlight that the overwhelming number of caregivers are older women. Unfortunately, these studies also detail a troubling trend—caregivers frequently experience stress, depression, anxiety, decreased quality of life, and decreased self-efficacy. To improve outcomes in older women with asthma, physicians should ascertain caregiver duties the patient may have. If identified, additional screening for depression or stress should be considered. Connecting the patient with appropriate resources, including mental health care professionals, social work services, and community advocacy groups, are activities that the physician can pursue as appropriate.

Limited Income or Poverty

Among older adults, poverty is common. A recent report from the US Census Bureau found that approximately 10% of older adults lived below the poverty line.⁵² Unfortunately, this number has been increasing in the past 10 years because of a variety of factors, such as increased medical costs, loss of pension or retirement benefits, spending down assets to qualify for Medicaid and state-sponsored supplemental insurance coverage, and economic recessions that require spending of retirement savings.⁵³ According to the US Census Bureau, women in the United States enjoy a longer life expectancy than men (81 vs 76 years of age), with approximately 60% of those older than 75 years being female, and this discrepancy increases with age. However, after adjusting for the increased total number of elderly women compared with elderly men, the rate of poverty in older women is much higher; in fact, elderly women are twice as likely to be living in poverty compared with elderly men.⁵²

Asthma care is often expensive (eg, medication costs, routine office visits, and hospitalizations), and lack of access to care because of poverty is a known risk factor for poor asthma

outcomes. Elderly people who also struggle with poverty are less likely to receive appropriate care for COPD, cancer, and cardiac disease.⁵⁴ Although similar studies have not been conducted among older adults with asthma, it would be expected that a similar pattern exists. Further, women report forgoing care because of cost or managing asthma through the emergency department as a result of coping with financial burdens.⁵⁵ Therefore, the asthma care specialist should assess the financial abilities of older women to adhere to recommended therapies. If barriers are encountered, a social worker may be instrumental in helping the patient access government-sponsored programs, health insurance, or pharmaceutical options.

Phenotypes of Asthma

In recent years, it has been hypothesized that asthma is a number of distinct syndromes or phenotypes rather than a uniform disease. One of the largest studies to examine asthma phenotypes in adults was conducted by the National Institutes of Health Severe Asthma Research Program.⁵⁶ Using cluster analysis, we identified 5 distinct phenotypes based on characteristics, such as age at asthma onset, lung function test results, eosinophilia, and health care use. One phenotype identified was primarily composed of women who had particularly poor lung function and high emergency department or hospitalization rates.

Important differences were observed for this phenotype compared with the others. The group was overwhelmingly female (71%), obese (mean body mass index of 33), and less responsive to bronchodilator reversal with albuterol and had late-onset asthma at a mean age of 42 years. This group had the highest incidence of sinus disease and gastroesophageal reflux disease of any phenotype and had the least atopy as determined by skin prick testing and total IgE levels.⁵⁶

Although differences in treatment response are not yet known, the care of older women with asthma may be improved by obtaining information such as age at onset, perceived benefit with albuterol, and a careful review for sinusitis or gastroesophageal reflux disease. For example, in women with late-onset asthma who appear nonatopic, treatment such as anticholinergic therapy may be more appropriate, although this hypothesis has yet to be formally investigated and merits further exploration. Further, treatment for sinus disease and gastroesophageal reflux disease may be most beneficial for such patients, although again further research is needed in this area.

Asthma Care of Elderly Populations

Although beyond the scope of this review, certain features of asthma care of the older adult patient (not specifically women) have been discussed in detail elsewhere and deserve careful consideration by the physician. These features include difficulties with inhaler use (due to arthritis, impaired inspiratory effort, or visual deficiencies), high use of complementary or alternative medicine, increased rates of aspirin-exacerbated respiratory disease, decreased responsiveness to short-acting β -agonists, and lower rates of asthma education. The reader is encouraged to read some of the well-written review articles that pertain to these and other issues for care of older adults with asthma.^{57–60}

Conclusion

Older women with asthma represent a specific demographic population with an unequal amount of morbidity and mortality related to the disease. Although the reasons behind these disparities continue to be an active area of investigation, asthma specialists can currently use numerous treatment strategies to improve care (Table 1). Better care of this vulnerable population is a goal that researchers and physicians should strive to achieve.

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